LAFAYETTE ESCADRILLE®

LOADING INSTRUCTIONS

IMPORTANT

This game tape is recorded in MACHINE LANGUAGE not BASIC and loading instructions may not be those you have used before.

TRS 80 Model III

(1) Press RESET button while holding down BREAK key. (TRS 80 will reply CASSETTE?)
(2) Enter L (low speed cassette).
(3) Set CASSETTE player volume to about **half** the level at which you normally load tapes. On CTR 80 A recorders, our programs have loaded at levels as low as "2".
(4) (Follow the Model I loading instructions below, starting at step 4.)

TRS 80 Model I, level II (and PCN 80)

(1) Rewind to beginning of side 1, Zero your tape counter.
(2) The TRS 80 program is recorded on the cassette.
(3) Set volume to 6 on CTR 41 recorder, to 4 on CTR 80 A. Volume settings can very widely between individual recorders, these are average values.
(4) Enter SYSTEM
Computer will reply *?
(5) Push PLAY button on recorder down and enter LOAD.
(6) Tape will start to turn. When you reach the beginning of the TRS 80 program, two stars will appear and one will blink. If this does not happen, see your computer manual for suggestions on volume adjustment.
(7) After a short time the blinking will stop, the tape will stop and the computer will reply *? Write down the reading on **your** tape counter. Five places earlier is a good point to start from for fast loads.
(8) Enter / (slash mark). The tape and blinking will start again and continue for about three minutes while the rest of the program loads. The computer will display title, opening credits and a situation message. It will ask for your name when it is ready to play the game. Do not be alarmed if the stars blink more slowly than usual for your machine. However, if they do not blink **at all** or if an error message appears try resetting the volume.

DIFFICULTY In Loading?

Problems may arise for several reasons not associated with our tapes.

(1) Output volume levels vary between one computer's tape player and another and our recommended volume settings may not be right for your particular machine. Since our tapes are in machine language, the volume setting you normally use for tapes pre-recorded in BASIC will probably be inappropriate. Follow the directions in your computer's manual to determine the correct volume setting and write it down for future use.

(2) The heads in your tape player may be out of alignment. This can still allow you to load programs you have recorded yourself, but interferes with loading of programs recorded on other machines.

(3) The heads in your tape player may need to be cleaned. However, if after checking the above, you still cannot load our original tape, return it to us with a description of the problem and how you tried to fix it and we will send you a replacement tape.

(4) You may also call 1-507-285-0150 for help in loading or running your game.

PIRACY

Reproductions of the tapes or other components of this game, by any means whatsoever, is prohibited. Persons copying or selling or distributing unauthorized copies of this material will be prosecuted to the full extent of the law.

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LAFAYETTE ESCADRILLE

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LAFAYETTE ESCADRILLE

Lafayette Escadrille was produced by 4-D Interactive Systems, Inc. for Discovery Games. Original game design by Capt. Dale Radtke. Development by Ross W. Maker. Artwork by Raymond Allard and Patrick Ciernia. Typesetting by Adventure Games, Inc. Printing by Ideal Printers, Inc. Recording by Tom Jones Studios.

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AIRCRAFT DATA

TYPE	MAX L/D	MIN	MT	FUEL	BL	RMG
GERMAN						
Fok.E.III	6/6	4	2	1800	0	N
Halb.D.III	6/7	3	3	1620	0	N
Pfal.D.IIIa	7/9	3	3	3000	1	N
Fok.Dr.I	7/8	2	4	1620	1	N
Alb.D.V	7/8	3	3	2400	1	N
Fok.D.VIIf	8/10	4	3	2160	2	N
Halb.CL.II	7/9	3	2	3600	3	Y
Alb.C.VII	7/8	3	2	3900	4	Y
BRITISH						
D.H.2	6/6	4	3	3300	0	N
Pup	7/8	2	3	3240	0	N
Triplane	7/8	3	3	3300	0	N
Camel	7/8	3	4	3000	1	N
S.E.5a	8/10	4	3	3240	1	N
Snipe	8/9	3	3	3960	2	N
F.2B	8/9	4	3	4320	3	Y
D.H.4	7/8	4	3	4620	4	Y
FRENCH						
MoS.6C.1	6/6	4	2	1800	0	N
Ni.11C.1	6/6	2	3	2400	0	N
Ni.17C.1	7/7	3	3	2400	0	N
Ni.24C.1	8/8	3	3	1980	0	N
SPAD.7C.1	8/10	3	3	3300	1	N
SPAD.13C.1	9/11	4	4	3120	2	N
Ni.12A.2	6/6	2	2	2880	2	Y
Bre.14B.2	7/8	4	3	4620	4	Y

NOTES:

MAX L/D = Maximum speed in level flight/maximum safe diving speed

MIN = Minimum safe flying speed

MT = Maximum turn of which the plane is capable

FUEL = Number of fuel units carried (each cycle the number used is equal to the Throttle Setting)

BL = Number of bombs the plane can carry

RMG = Presence (Y) or absence (N) of a rear seat gunner

COMMANDS

The following keys are active during the game:

Q, Y, B, U, N, G, H, 2, 3, 4, T, R, and V.

To input a command, hold the appropriate key(s) down until the block in the upper right hand corner blinks off.

Q. Pause. Allows you to halt the game to answer the telephone, let the dog out, etc. To continue, depress Q again.

Y. Open Throttle. Increases speed (and fuel consumption). If throttle setting is already at maximum, this command will be ignored.

B. Close Throttle. Reverse of Y. Will be ignored if throttle is at zero.

U. Lift Nose. Initiates climb from level flight, pulls out of dives.

N. Push Nose Down. Starts dives, levels off from climbing.

G. Left Turn and H. Right Turn. Alter the heading of the airplane forty-five degrees in the appropriate direction. To make tighter turns, hold down the 2, 3, or 4 key at the same time as G or H. These correspond to 90, 135, and 180 degree turns. If your plane cannot make the turn requested, it will make the maximum possible.

T. Fire Forward Machine Gun. Expends one unit of ammunition.

R. Fire Rear MG. Will be ignored if there is no target or no rear gunner.

V. Drop Bomb. Will be ignored if no bombs are available.

MISSIONS

Patrol missions require you to fly over a certain area of the map for a stated number of cycles. (A cycle is the period it takes for the cursor in the upper right hand corner to blink on and off once.) When this has been achieved, a $ will appear to the right of your fuel gauge. You may then return to either friendly airfield. The area for the Defensive Patrol is the four columns of map-squares behind the friendly trench lines (24-27 for the Allies or 30-33 for the Germans). Standing Patrols must be maintained over the trenches (columns 28 and 29). Offensive Patrols take you over the enemy rear area, the two columns behind the enemy trenches (26 and 27 if you are German or 30 and 31 if you are Allied). Long Range Patrols require penetration of the enemy's support areas (columns 32-33 or 24-25 for Allied or German pilots, respectively).

Bombing missions require you to attack and destroy the assigned target. Practice is needed to recognize the correct approach path for each type of target and the appropriate lead for the altitude at which you are flying.

Training flights are carried out in the same area as Defensive Patrols. Every time you sign on or crash, you will be asked if you want to make a training flight. If you do not answer in the affirmative, you will be put on operational status and given a mission. If your training flight is successful, you will be given up to two more training flights. You can never make more than three successful training flights consecutively. While you are on training status, you will not be attacked by enemy aircraft. If, while on a training flight, you should cross The Front, your training status is immediately revoked.

Balloon Busting. This is an optional activity, not to be engaged in by green pilots. Observation balloons are usually protected by anti-aircraft guns. They also have a habit of destroying your plane by blast if you press your attack too closely before flaming them. And their ground crews are invariably trying to pull them down for protection, which may lead you to inadvertantly fly into the ground while diving after them. The best aiming point is the nose of the bag, where the cable is attached. To have a chance of hitting a balloon, you must be fairly close, both in altitude and range. You may want to try some approaches on friendly balloons. The observers will be annoyed, but at least Archie (anti-aircraft) isn't likely to fire at you.

Enemy Aircraft. From time to time, you will encounter enemy planes that will attempt to engage you. These can be shot down if you can maneuver into a position where you are fairly close in both range and altitude and have him directly in front of you. If you have a rear gunner, he can engage any planes astern or abeam, as long as they are not below you.

HAZARDS

Stalling. This is caused by inadequate speed. Any time the speed of your plane drops below the number listed under MIN for that type on the AIRCRAFT DATA TABLE, it will stall and the message STALL will appear in the lower right-hand corner of the screen. If you have sufficient altitude, you can recover by immediately depressing the N key. This will put you into a dive, thereby increasing your speed. Remember to open your throttle before pulling out. If you are not quick enough, or are too close to the ground, you will crash. The most common causes of stalls are attempting to climb with insufficient speed (climbing reduces your speed to one less than the throttle setting) and throttling back, thus bringing your speed below the safe level.

Over-stressing. This is caused by excessive speed, which causes the drag and/or torsional forces operating on your plane to induce structural failure. There is no chance for recovery. This occurs in dives. A normal dive increases your speed by one, while a steep dive (caused by a second N command) increases it by one more. If your speed exceeds the second number under the MAX L/D entry on the AIRCRAFT DATA TABLE, your plane will crash. Always check your speed before diving, and throttle back if necessary.

Anti-aircraft guns. Located mostly around balloons and in the trenches, AA guns (also known as flak, ack-ack, and Archie) can be deadly to low-flying aircraft. The only real defense is to maintain your altitude in areas where they are present.

Bomb blast. If you fly too low over an exploding bomb, your airplane can be wrecked by the force of the blast or by flying debris. Exploding observation balloons can also have blast effects on your plane.

SPECIAL MANEUVERS

Immelmann turn. This maneuver consists of performing a half loop with a half roll at the top. It is a way of reversing direction while gaining height. To perform an Immelmann, start a climb (U), then enter U again. Remember to have your speed well up so you won't stall.

Split-S. In many ways this is similar to an inverted Immelmann. You put your plane into a steep dive, do a half roll and finish up as if you were pulling out of a loop. In *Lafayette Escadrille,* put your plane into a dive (N), enter N again to make the dive steeper, then enter a third N to finish. This maneuver must be approached very carefully. As you will discover, it is entirely too easy to over-stress your plane or fly into the ground. Make sure that you have plenty of altitude and that your throttle is well back.

SPECIAL NOTE: THE ALTITUDE SCALE

The left-hand side of the screen serves as an altitude scale. Your relative altitude is marked by an @. Any enemy aircraft which is present will be represented by %, while balloons use 0. If you should drop any bombs, they will have their altitudes indicated by the numbers 0, 1, 2, and 3.

STARTING THE GAME

When the program has loaded, you will be asked to choose a nationality. Enter 0, 1, or 2. Next you will see a list of aircraft types to choose from. Enter 0, 1, 2, 3, 4, 5, 6, or 7. The machine will then ask if you want to try a training flight. If so, enter Y, if not, N. You will now start the game. The screen will show your plane sitting on the runway of one of the two airfields on your side of the lines. A brief description of your mission will be printed on the top of the screen. To start play, hold down the Y key until the speed indicator goes to 2 from 0. Your plane will now start to move down the runway. All commands may now be used normally.

ENDING THE GAME

After you have landed safely (or crashed) the score screen will appear. It will show not only the score for that game but the accumulated score since you loaded the program (or the last time you crashed or were captured). To play again, hit the ENTER key. To end the session, turn off the computer.

AIRCRAFT NOMENCLATURE

GERMAN. Each type accepted for service with the Luftstreitkraft was assigned a three part designation consisting of the official abbreviation of the manufacturer's name, a letter indicating the function of the plane, and a Roman numeral indicating its place in the sequence of types in that category accepted from that manufacturer. The main categories were C (armed two-seater), CL (light C-type), D (single-seat biplane fighter), Dr (single-seat triplane fighter, originally F), E (single-seat monoplane fighter, absorbed into D types in 1918), G (multi-engined, multi-seat aircraft), and R (Reisenflugzeug, very large aircraft). This system went out of use in Germany in 1919, but Fokker continues to number its products in the old sequences to this day.

BRITISH. The Royal Flying Corps never had an official nomenclature policy. As a result, its aircraft were known by a strange mixture of manufacturers' designations and popular nicknames. The Royal Naval Air Service had a policy of referring to a type by the serial number of the first production plane. This was largely ignored by the pilots themselves, who rapidly developed nicknames for almost all the types used by the RNAS. Although some bureaucrat in the Admiralty found time to issue repeated orders that under no circumstances was the Sopwith Type 9901 Scout to be referred to by any other designation, to every man at the front it was the Pup, and the Pup it remained. In April of 1918, when the Royal Air Force was formed by the merger of the RFC and the RNAS, it was decided that henceforth all British warplanes were to be given names. Those aircraft already in service which had acquired acceptable names had them officially confirmed. Those known by various manufacturers' codes had those accepted, in the fond hope that they would soon be replaced by more modern types. This system has continued in use to the present day.

FRENCH. The Aviation Militaire gave each aircraft type a four part designation. First came a two to four letter abbreviation of the manufacturer's name. Next came a number indicating the sequence of that type among those offered by that manufacturer. Although this was sometimes written with Roman numerals, all official documents use Arabic numerals. The third element was a one or two letter code indicating the intended use of the type (e.g. A for reconnaissance de Armee, B for Bombardment, and C for avion de Chasse [fighter plane]). Finally, there was a number indicating the normal crew strength of the type. With some modifications, this system remained in use down to 1940.

FRENCH AIRCRAFT

MoS.6C.1. The wartime production version of the Morane-Saulnier Type N racing monoplane was an example of the makeshifts to which the allies were forced to resort due to the lack of an effective synchronizing gear. The Morane had a single machine gun, usually a Lewis, fixed to the engine cowling, and metal deflectors on the propellor blades to keep those rounds which did not pass between them from damaging the prop. This was not, of course, good for the efficiency of the airscrew, and the direction in which the bullets were deflected was completely unpredictable. If this wasn't enough to destroy any hope of popularity for the type, it had a high stalling speed and was very unresponsive to the controls. The French and the British each obtained about 36 (including the 'improved' Types V and I, both covered under the MoS.6 designation), and the Russians bought 24 in France and built an unspecified number themselves. The MoS.6C.1 entered service in March of 1915, and was withdrawn from the Western Front in October of 1916, although at least one Russian MoS.6 was still in service during the Civil War over a year later.

Ni.11C.1. The first of the Nieuport single-seat sesqui-plane scouts, the Bebe, so-called for its diminutive size, was a welcome replacement for the odd lot of Moranes, Caudrons, and Bleriots that the French had been flying in the scout/fighting role. With a single Lewis gun mounted atop the upper wing to fire over the airscrew arc, it was more effectively armed than its predecessors, and had both better performance and better maneuverability. It entered service in the late summer of 1915, when the "Fokker Menace" was blasting Allied reconnaissance machines out of the air with virtual impunity, and served well into the next summer. An excellent fighting machine, the Bebe was hampered by its tendency to shed its lower wings in a dive. This was due to the fact that the small bottom wing had only a single spar, which tended to break under the torsional stresses of high speed dives.

Ni.17C.1. The Superbebe, or 15 metre Nieuport, was an enlarged and up-engined edition of the 11 which began appearing in May of 1916. Although it was faster and better armed than its predecessor, with a synchronized Vickers gun on the cowling, the 17 retained the same structure as the 11, resulting in the same disability in diving. Like the Bebe, the Superbebe served in almost all the Allied air forces, being license built in Italy, Britain, and, possibly, Russia.

Some even found their way into the U.S.Air Service, albeit as trainers. It would appear that no record survives of the number of Nieuport scouts built, but it must have been substantial.

Ni.24C.1. With yet another increase in engine power and serious attempts to refine the streamlining of the hitherto slab-sided fuselage, the 24 and the similar 27 represent a last ditch attempt to salvage the sesqui-plane line. Unfortunately, the reason for the recurring wing failures was still not understood, and so could not be remedied. Although some of the big name aces, such as Guynemer, preferred the Nieuports, they were progressively replaced by the faster SPADS, especially in the elite escadrilles.

SPAD.7C.1. Although it entered service in October of 1916, the SPAD.7 was not very numerous until late the next spring. Designed around the excellent, if heavy, Hispano-Suiza inline engine, the SPAD gave better performance than the Nieuports, if not better maneuverability. It was also much stronger. A pilot didn't have to worry about losing his wings in a dive, and its engine was less vulnerable to enemy fire than the Gnome or Le Rhone rotaries of the Nieuports. Some of the 5800 or more built were still in service at the Front at the end of the war, largely due to the French policy of making sure that the elite units got the newest equipment first, with the more ordinary escadrilles getting along as best they could.

SPAD.13C.1. Larger, more powerful, and better armed than the 7, the SPAD.13 was the definitive French fighter of the Great War. With two Vickers guns synchronized to fire through the propellor, the SPAD was a match for the German fighters in firepower, and more than their equal in speed and maneuverability. In addition to the Aviation Militaire, the U.S. Air Service adopted the 13 as its standard fighter. Such aces as Frank Luke and Eddie Rickenbacker gained most of their victories in SPADs. Although the 13 was introduced in July 1917, deliveries were hampered by faults in the 200hp Hispano-Suiza engine, and did not appear at the Front in large numbers until 1918. About 8500 were delivered by the end of that year.

Ni.12A.2. Similar in configuration to the Ni.11, this two seater was the standard French reconnaissance plane from early 1915 until the fall of 1916. Originally armed with only a Lewis for the observer, Ni.12s were soon fitted with another mounted on the top wing. Serving with most of the Allied air forces, the Ni.12 was used as a two-seat fighter and a bomber as well as in the intended reconnaissance role. Of typical Nieuport sesqui-plane design, it had, like the single-seaters, only a single spar in the lower wing, giving it a limited diving ability.

Bre.14B.2. Louis Breguet's massive single engine two-seater entered service in the summer of 1917. Built in both bomber (B.2) and reconnaissance (A.2) versions, it was soon serving in some 93 escadrilles of the Aviation Militaire as well as two Belgian escadrilles and at least two USAS squadrons. Strong, powerful, and, for a two-seater, highly maneuverable, the Bre.14 was one of the most effective aircraft at the Front.

GERMAN AIRCRAFT

Fok.E.III. The definitive Eindecker (monoplane) scout, the E.III was not an outstanding airplane. Neither stable nor particularly maneuverable, it was, however, equipped with a synchronized machine gun, allowing the pilot to aim the gun by flying the airplane. When Roland Garros' MoS.3A.2, fitted with a fixed machine gun and deflector plates on the propellor blades, fell into German hands, Anthony Fokker was one of the manufacturers invited to fit similar installations to their products. While not the brilliant designer he styled himself, Fokker was given to flashes of insight, and was an outstanding salesman. While his rivals set about meticulously copying the makeshift French device, he recruited a watchmaker to design a mechanism which would only allow the gun to fire when there was no prop blade in front of it. With this device fitted to a Fok.A.III, he returned to the Luftstreitkraft command, which promptly accepted the conversion as the E.I and ordered an improved version, the E.II, to be supplied on the basis of two for every Flieger Abteilung (Fl.Abt. = Flying Unit). Several more E.I conversions were made for service tests, and the more powerful E.II began appearing at the Front in August 1915, followed shortly by the more refined E.III. Late in the year, when the Eindeckers were already obsolescent, the E.IV appeared. This model was designed with a two gun armament, but its engine was very unreliable, and only a few were built. The entire production of Fokker Eindeckers seems to have totaled about 250 machines, but these, together with about 200 similar Pfalz E types, were sufficient to create the "Fokker Menace" which dominated the air over the Western Front in the summer and fall of 1915.

Halb.D.III. With the addition of armament to the Ni.11C.1 and the introduction of the D.H.2 (q.v.), the Eindeckers became obsolete almost overnight. Halberstadt attempted to redress the balance with its biplane scouts (D.I-IV) which, together with similar designs from Fokker (D.I-V), were the first mounts of the newly formed Jagdstaffels (Jastas = Fighter Squadrons) formed in the spring of 1916. Unfortunately, these planes were inadequate in both performance and numbers for the task set for them. Although designed with two guns, the Halberstadts usually flew with only one, the weight of the second gun imposing too great a performance penalty. Indeed, many pilots, including Immelmann, preferred to continue flying the Fok.E.III until the more powerful and better armed Albatros scouts became available.

Pfal.D.IIIa. In the normal order of things, the Pfalz D.III would never have entered production. It appeared five months after the Alb.D.V, used the same engine and a similar sesqui-plane layout, and was only about two miles per hour faster. Against all this was the fact the the Pfalz establishment was the only aircraft factory in the Kingdom of Bavaria, and the strange circumstance that Bavaria had been allowed to maintain its military establishment separately from the rest of the German Empire. Thus when the time came to replace the Rol.D.II scouts (built by Pfalz) serving in the Bavarian Jastas, it was a foregone conclusion that the orders would go to the

Pfalz concern. It was originally intended to build the Alb.D.V under license, but the marginal speed advantage of the indigenous product was seized upon as an excuse to produce it instead (thus saving the royalty fees). At first there appeared to be no significant difference between the D.III and its rival, but the pilots soon learned that here was a V-strutter that they could dive with full confidence. The difference was the two close-set spars in the lower wing, as opposed to the single member found in other sesqui-planes. This arrangement successfully resisted the torsional forces so often fatal to Nieuports and Albatroses. Total production of the sleek Pfalz scout was only about 600, of which over half were of the D.IIIa version with an uprated engine.

Fok.Dr.I. Quiescent for nearly a year, the Fokker design team, now led by Reinhold Platz, re-entered the fighter sweepstakes in the spring of 1917 with a radical new airplane. Inspired by rumors of a new Allied scout (Sopwith Triplane, q.v.), Fokker ordered Platz to produce a triplane. The diminutive machine which resulted not only employed the triplane layout, but used thick section cantilever wings as well. This allowed Platz to dispense with the usual drag-inducing bracing wires. Indeed, the prototype first appeared without interplane struts; they were added later to ease the anxieties of service pilots. The highly maneuverable Dr.I soon became the favored mount of such aces as Richtofen and Voss. Like the Sopwith Camel, however, the price exacted for this agility was one of constant vigilance and a high degree of flying skill. In addition, pressure from Berlin to get the new planes to the Front as rapidly as possible, combined with sloppy inspection procedures at the plant, led to a number of machines being delivered with poorly constructed wings. This led to several fatal crashes. The ensuing investigation led to better quality control, but many pilots remained suspicious of the type. Periodic engine failures did nothing to increase pilot confidence. In the end, however, it was the fact that the Dr.I lacked the performance advantage necessary to make up for Germany's numerical inferiority that caused production to be stopped after 320 had been delivered.

Alb.D.V. Although the first Albatros scouts (D.I and II) were conventional biplanes, the D.III introduced the Nieuport style sesquiplane layout to the Jastas. Fast, well-armed, and sturdy, the Alb.D.III soon regained the aerial superiority that the Eindeckers had lost in 1916. It had, however, the same deadly flaw as the Nieuport "V strutters;" in a high speed dive torsional forces tore the single-spar lower wing loose from the airframe, usually with fatal results. The D.V, introduced in May 1917, had small struts running from the leading edge of the lower wing to the interplane struts in an attempt to alleviate this problem. This fix was only partly successful, merely raising the speed at which failure occurred by a small amount. In addition, the D.V was fitted with a more powerful engine, but this failed to boost performance enough to enable it to deal with the new SPADs, S.E.5as, and Camels, and the hardwon superiority of the spring slipped away in the course of the summer. Despite its flaws, the D.V rapidly became the most important component of the Jastas, over 1000 being at the Front by January 1918.

Fok.D.VIIf. It was fortunate for the Allies that they had built up a nearly overwhelming numerical superiority in the air over the Western Front by May 1918, because in that month technological superiority swung sharply in favor of the Germans. Jagdgeschwader 1 (JG1 = Fighter Group 1, made up of Jastas 4, 6, 10, and 11), which had been mysteriously absent since the death of its commander, Richtofen, several weeks earlier, reappeared at the Front, filled with the desire to avenge its fallen hero and armed with a new airplane. Soon the D.VII became the most feared plane in the German inventory, so much so that one of the terms of the Armistice demanded the immediate surrender of all machines of this type to the Allies. (142 of these were shipped home by the USAS.) By that time 46 Jastas had been fully equipped with the type and a total of 775 were at the Front. Most of these were of the f variant which had been introduced during the summer. In the D.VIIf, the original 160hp Mercedes engine was replaced by the 185hp B.M.W., which added to the already excellent performance and maneuverability of the type. Joined to these characteristics were great structural strength and a docility surprising in so agile a plane. Even a novice could fly this plane well, and in the hands of men like Udet it was the most effective fighter of the War. When production was stopped by the Armistice, some 1100 had been delivered.

Halb.CL.II. Originally intended as two-seat escort fighters, the CL types, like their British equivalent, the F.2B (q.v.), soon acquired a variety of offensive roles, most notably ground attack and close support. While trench strafing was left mostly to the armored J types, such targets as supply points, assembly areas, gun positions, bridges and command posts all fell to the lot of the Schlachtstaffels (Schlastas = Attack Squadrons). Most of these were equipped with the Halberstadt CL.II or the very similar CL.IV. The Halberstadt was a compact, sturdy, maneuverable plane, but its performance was hampered by the use of the 160hp Mercedes. More powerful engines were in production, but they were reserved for fighters and the heavier C types. Just before the Armistice, Halberstadt introduced an even smaller version, the CLS.I, which squeezed a little more performance out of the Mercedes, but there was not enough time to get it into production. Right down to the end of hostilities it was in the Halb.CL.II and CL.IV, with the less numerous Hannover CL.II and CL.III, that the pilots and gunners of the Schlastas carried out their varied and thankless duties.

Alb.C.VII. This plane, typical of mid-war C types, was introduced in late 1916 as an emergency replacement for the Alb.C.V, which was doomed by the unreliability of its 220hp Mercedes engine. The C.VII was virtually a C.V re-engined with the well-tried 200hp Benz, with a few aerodynamic modifications as well. Oddly, there was no noticeable loss of performance (probably because the big Mercedes almost never delivered its rated power), and the C.VII became quite popular with its crews. Like most C type aircraft, it was used for bombing, artillery direction and reconnaissance as required, and performed all these roles well.

BRITISH AIRCRAFT

D.H.2. Geoffrey de Havilland's second design for the Aircraft Manufacturing Company (Airco) was a neat little single seat pusher. Although the disadvantages of the pusher configuration compared to tractor types were understood, the lack of an efficient synchronization gear made the clear field of fire offered by the pusher attractive. By careful design, de Havilland produced a plane with performance as good as that showed by its tractor contemporaries. The location of the D.H.2's rotary engine near the center of gravity of the plane gave it a good maneuverability, but also made it prone to spinning. Since this phenomenon was not well understood at the time, the D.H.2 at first acquired the reputation of a killer. Development of recovery techniques soon laid this bugbear, although the D.H.2 was never an easy plane to fly. It was also cold, since the cockpit was not well protected and the engine's warmth streamed back away from the pilot. Even with these drawbacks, when 24 Squadron, RFC, the first unit anywhere to be entirely equipped with single-seat fighters, took its D.H.2s to France in February 1916, the days of the "Fokker Menace" were definitely numbered. Unfortunately, the little pusher was retained in front-line service until June 1917, well beyond the time it was outmatched by the newer German types.

Pup. Sopwith Aviation's first single-seat fighter arrived at the Front in September 1916, initiating the long line of famous Sopwith/Hawker/Hawker-Siddley fighters that leads through the Camel and the Hurricane to the modern Harrier. The Pup was one of the few fighters of World War I that combined excellent maneuverability with complete docility. That characteristic, together with its retention of performance at high altitudes, valuable for Home Defence missions, was probably the reason that it stayed in production until nearly the end of the War, although it had been withdrawn from the Western Front in December 1917. Eventually, more than 1800 were delivered.

Triplane. The impact of the next Sopwith scout was all out of proportion to the small number (about 150) built. For the rest of the war, manufacturers on both sides of the lines produced numerous triplane fighters in a mostly vain attempt to reproduce the Tripe's maneuverability and climbing performance. The Type N500 (known at the Front as the Triplane, Tripehound, and Tripe) was similar in construction to the Pup except for its unusual wing cellule. The three narrow chord wings offered plenty of lifting area and still allowed good all around view. The 130hp Clerget rotary provided plenty of power, and the structure was quite strong. Normally only one synchronized Vickers was carried, although the last six planes were delivered with twin guns. The Triplane served only with the RNAS, and only with 1, 8, and 10 Squadrons. B Flight of the last, made up entirely of Canadian pilots, shot down 87 German aircraft in three months. The operational career of the Triplane was short, lasting only eight months. Naval One took its machines into combat for the first time in April 1917, and the last were withdrawn the following November.

Camel. Even more maneuverable than the Pup or the Triplane in the hands of a good pilot, the Camel had no trace of their tractability. If a pilot was inattentive, or even hesitant, his plane could go into a spin and crash before he was even aware that he was in trouble. The difficulty was caused by the location of the engine fairly close to the center of gravity. This allowed the torque forces set up by the whirling mass of the rotary engine to have great effect on the stability of the airplane. While this was dangerous to the inexperienced pilot, a good flyer could use the instability to his own advantage in a dogfight. When the Camel first appeared at the Front in June 1917, it was superior to every fighter in the German inventory. Only in 1918 with the introduction of the Fokker D.VII was it finally outclassed in performance. Some 5700 were produced, including 190 of the shipboard version.

S.E.5a. The product of the Royal Aircraft Factory (Royal Aircraft Establishment from 1918), the S.E.5a was a surprisingly good airplane, considering the dismal record exhibited by other RAF/RAE designs such as the B.E.2 and F.E.2B. The first SE5s went to France in April 1917, and exhibited the need for modifications. By July, SE5as were reaching the squadrons and the promise shown by the earlier model was fulfilled. Unfortunately, the SE5a was powered by the same 200hp Hispano-Suiza used in the SPAD.13, and was therefore plagued by the same difficulties in obtaining reliable engines. While the French preferred to await the solution of the Hisso's problems, the British set the Wolseley Motor Co. to redesign the engine. The resulting Viper became the standard SE5a power plant. The rather odd armament pattern of the SE5a, one synchronized Vickers and one Lewis atop the upper wing, was the result of the expressed preference of Albert Ball, then the ranking British ace. Ball would fly under his victims, tilt the Lewis to a near vertical position and fire into the belly of his target. Whether most pilots thought this a reasonable method of attack is open to question, but nobody wants to contradict a national hero.

Snipe. The final rotary-engined scout from Sopwith was neither as maneuverable nor as difficult to fly as the Camel, but had an excellent performance. Although only introduced to combat in September 1918, the Snipe established a good reputation by the Armistice and was slated to replace the Camel in shipboard and Home Defence roles as well as at the Front. It was in a Snipe that Canadian ace Billy Barker won the Victoria Cross for his single handed fight against more than fifty enemy aircraft. Two developments of the Snipe were also slated for large scale production, but were overtaken by the end of hostilities. Two or three examples of the armored trench strafing version, the Salamander, actually reached France, but were too late to see active service. The Dragon was a Snipe fitted with the new 360hp Dragonfly radial engine instead of the standard 230hp Bentley Rotary. This power plant gave the Dragon phenomenal performance, but its extreme unreliability doomed the project, and no production Dragons were delivered.

F.2B. Frank Barnwell's legendary Bristol Fighter was nearly taken out of service right after its first mission. The pilots, unfamiliar with the type, adopted standard two-seater methods, maneuvering only to give the gunner a better shot. The result was disaster. High losses soon forced the adoption of more aggressive tactics. Much to the surprise and delight of the crews, the F.2B showed itself to be an agile and rugged fighting machine. Losses dropped dramatically, and victories and morale climbed. Excellent performance, load carrying ability, endurance, and survivability soon caused the Brisfit to be cast as a maid of all work. Fighting, long range reconnaissance, artillery direction, infantry contact patrol, and light bombing all came within its sphere. From June 1917 into the 1930s, from fighter to trainer, the F.2B performed all tasks required of it, always competently, often brilliantly. By the time production ceased, over 5500 had been delivered.

D.H.4. The first British warplane designed as a high-performance day bomber, the D.H.4 began its combat career in the midst of "Bloody April," the worst debacle suffered by the RFC during the War. The large scale introduction of the Albatros D.III scout, along with the concentration of German air assets in the British sector of the Western Front in April 1917, nearly drove the RFC from the skies. Among the two-seaters in use for bombing and reconnaissance, only the new de Havilland seemed to be relatively exempt from horrifying losses, largely due to its ability to operate at high altitudes, where the Hun had difficulty intercepting it. The D.H.4 was also the only American-built plane to see combat service in the Great War. While the RAF had already begun replacing its D.H.4s with the "improved" D.H.9 (which suffered from inadequate output from its unreliable B.H.P. engine), the United States Air Service was introducing the Liberty Plane (powered by the 400hp Liberty engine in place of the 325hp Rolls-Royce Eagle used in British D.H.4s) to combat. So successful was this combination that the RAF solved the D.H.9's problems by installing the Liberty. About 1450 British built D.H.4s served in 21 RFC/RNAS/RAF squadrons and 6 Belgian escadrilles, while 13 USAS and 4 USMC squadrons used the 1200 Liberty Planes sent to France of the 4350 built.

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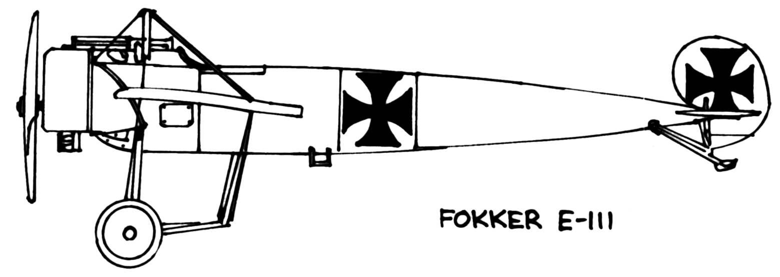
A DISCOVERY GAME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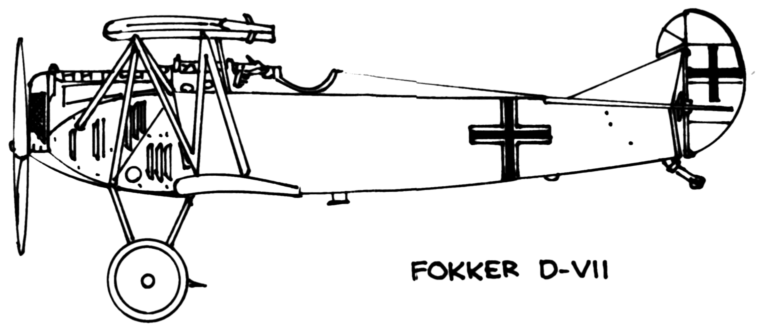
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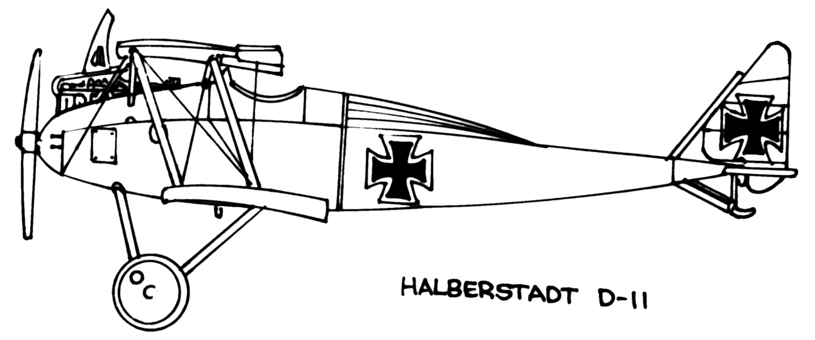
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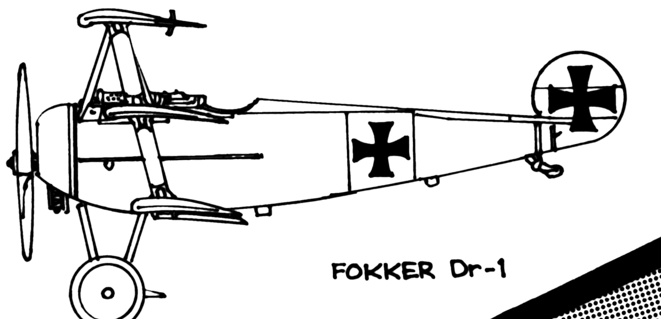
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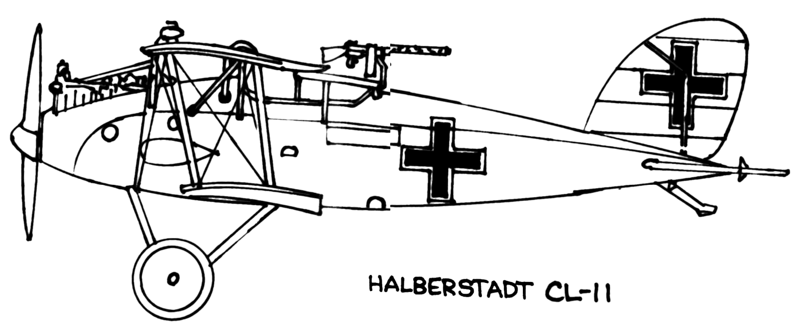
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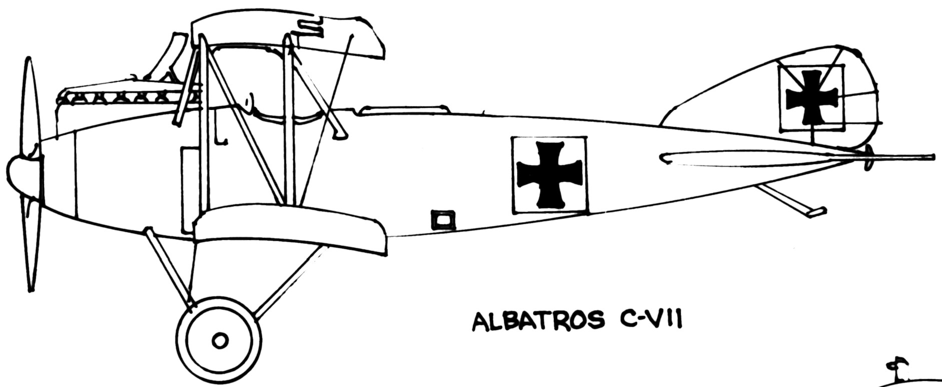
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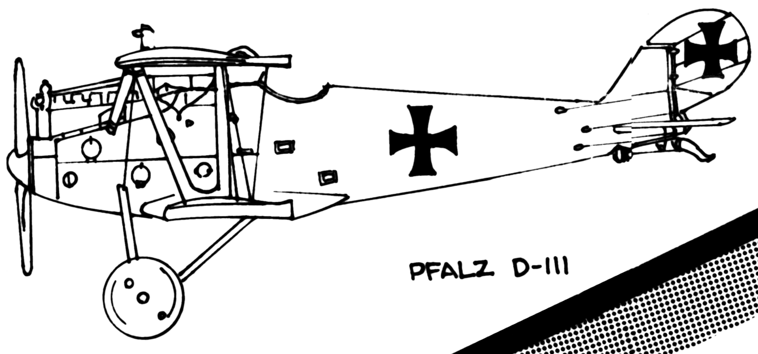
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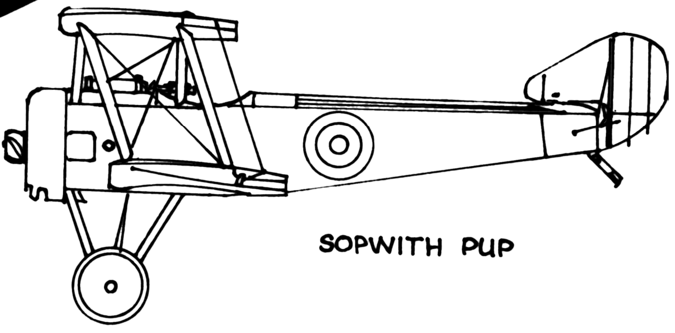
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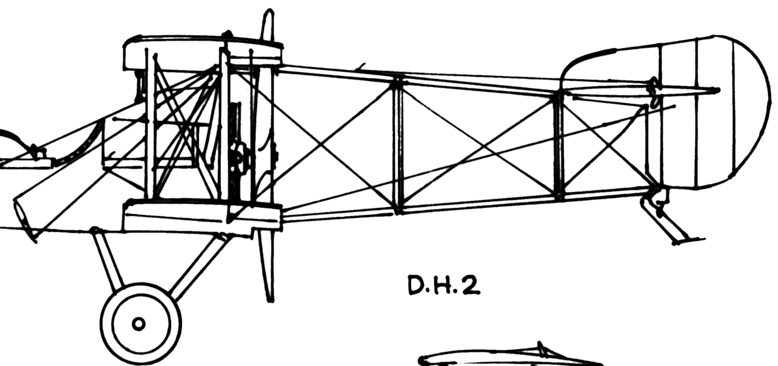
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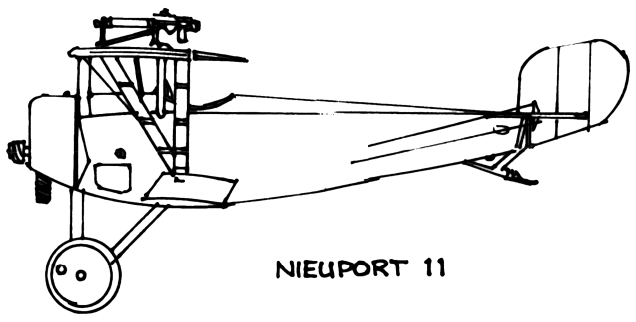
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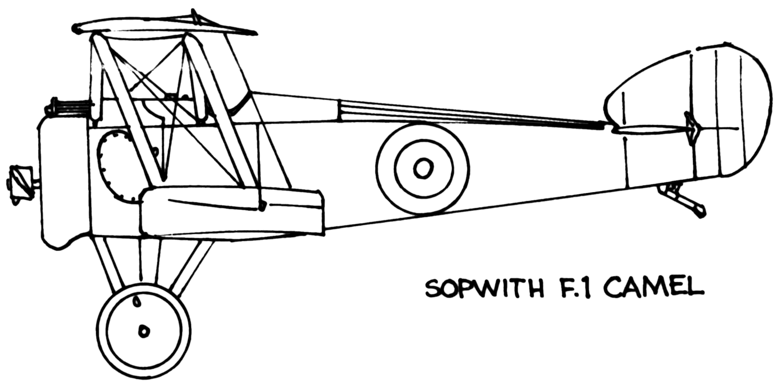
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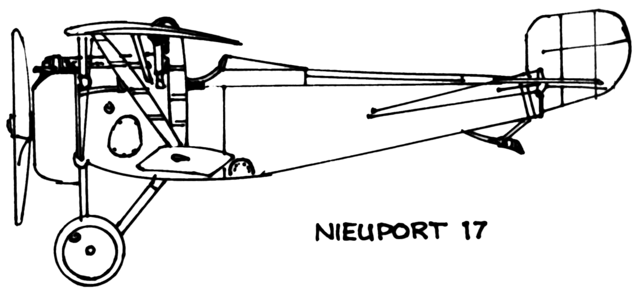
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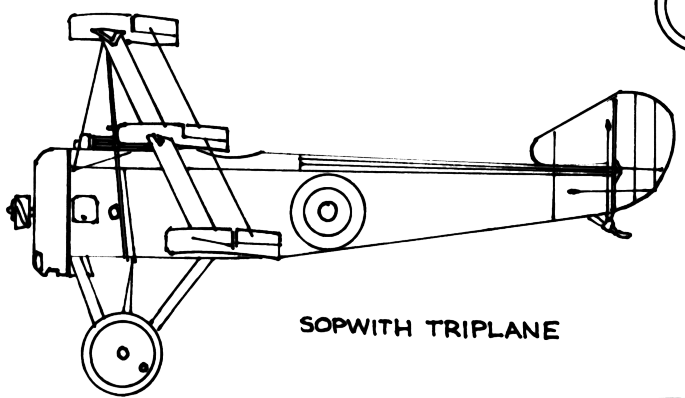
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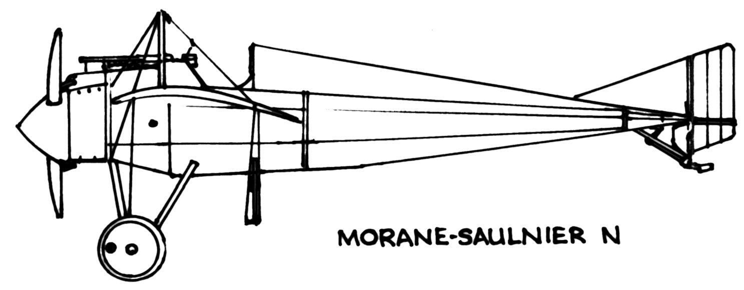
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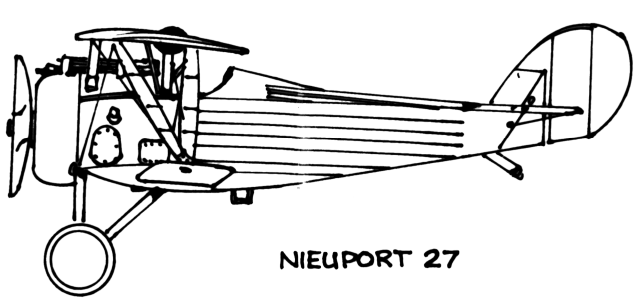
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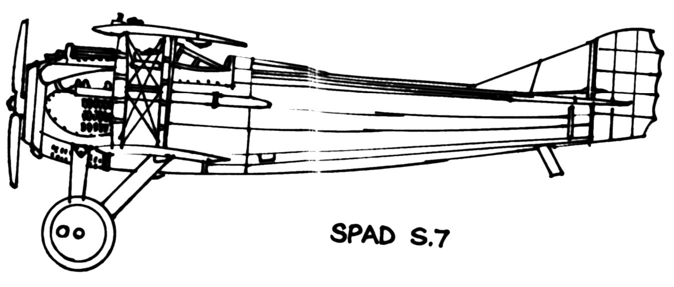
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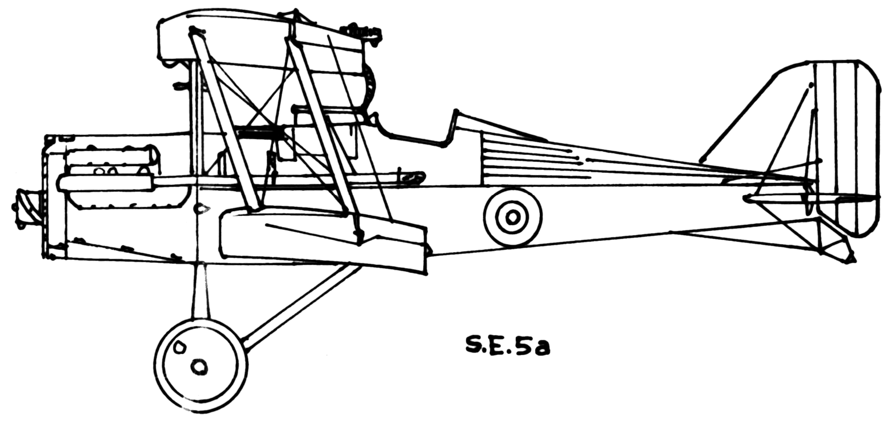
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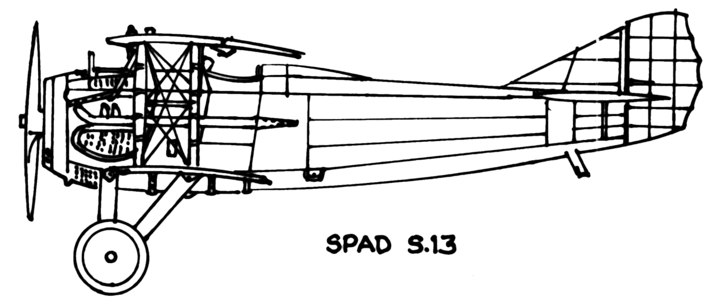
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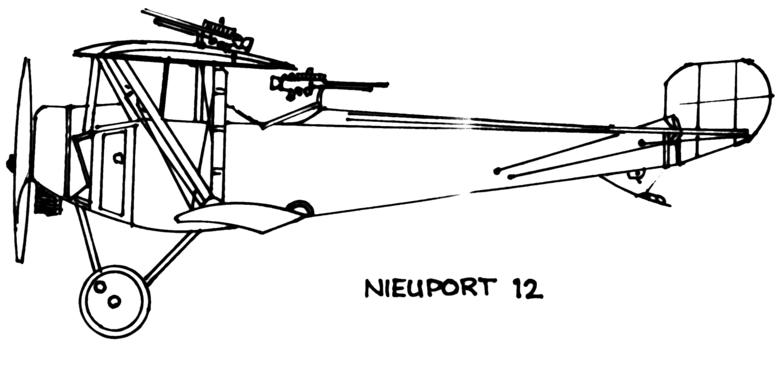
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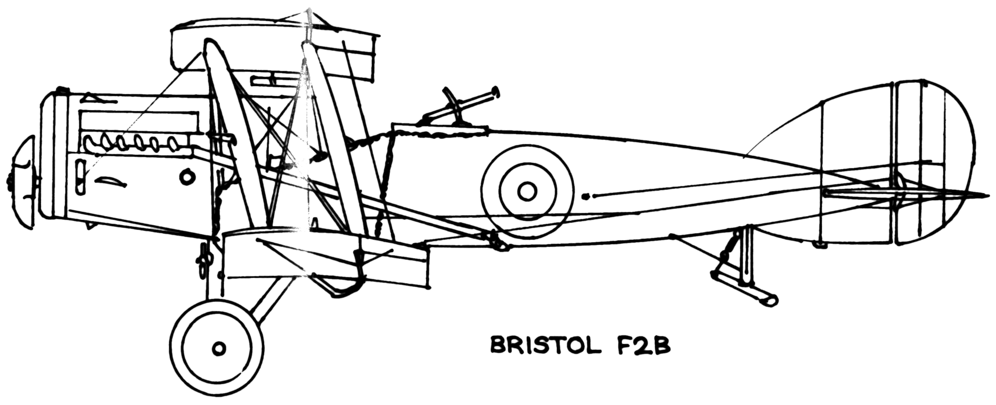
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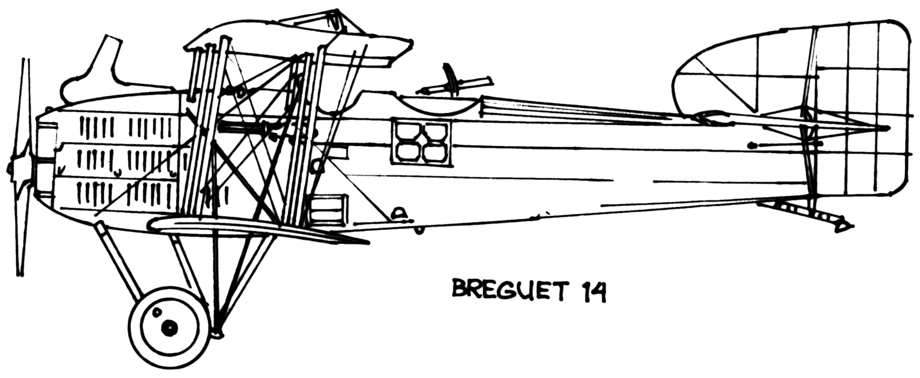
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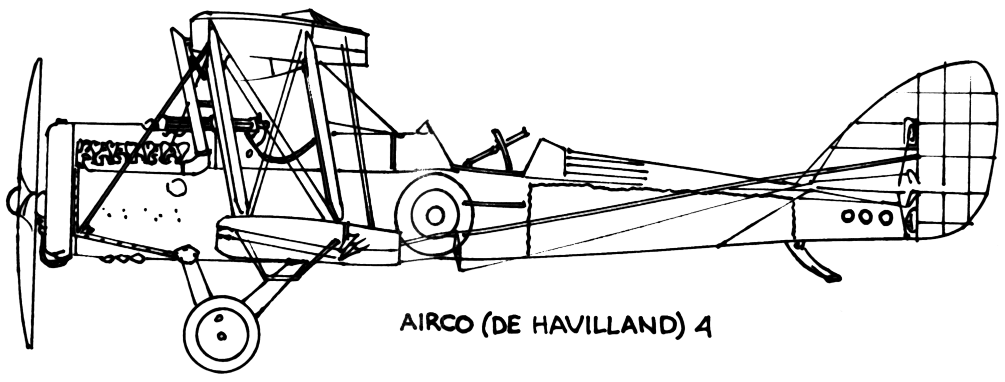
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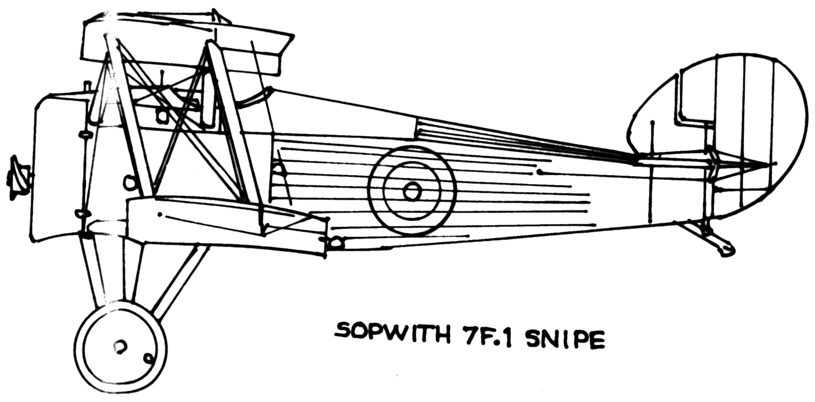
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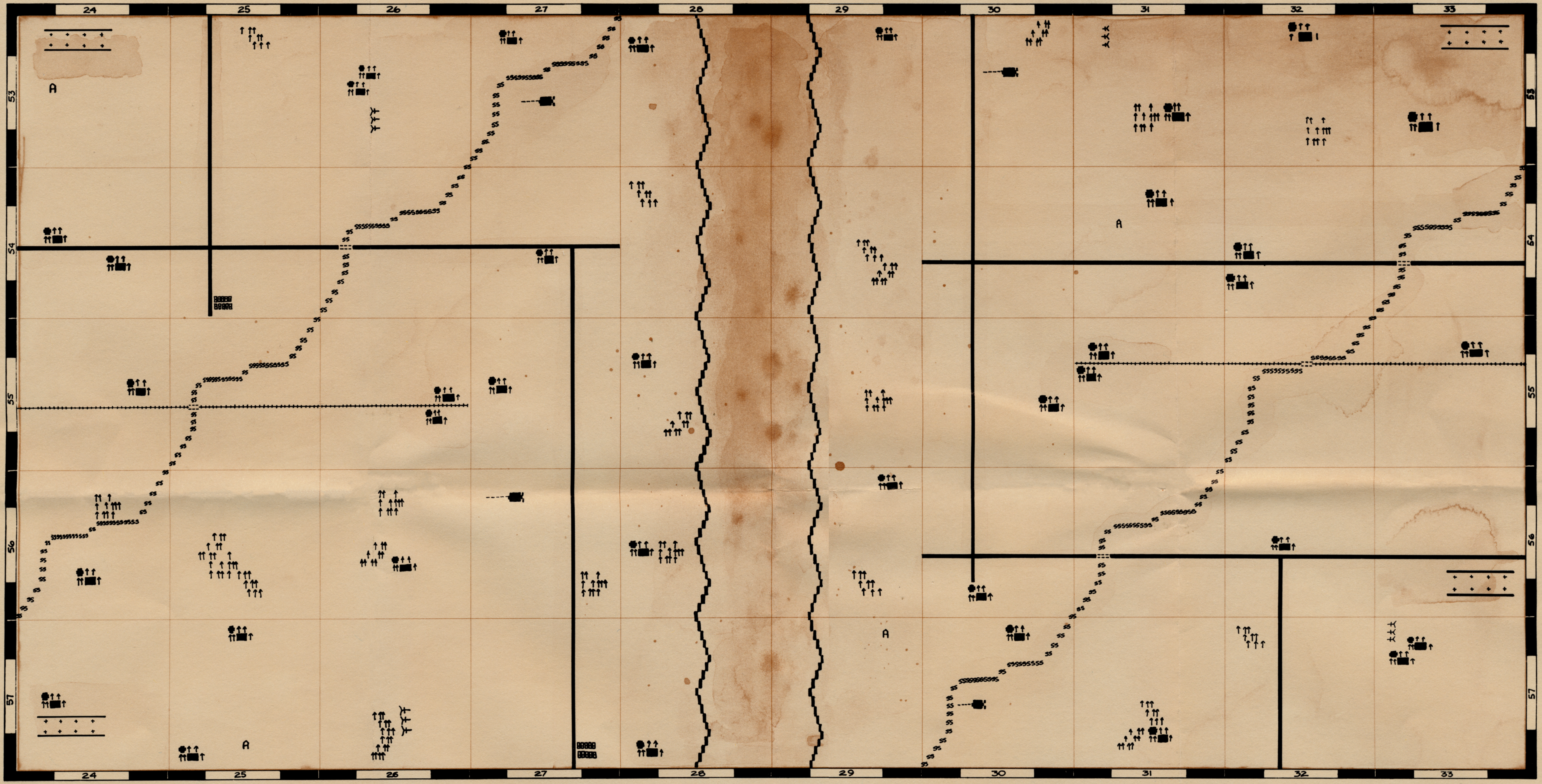

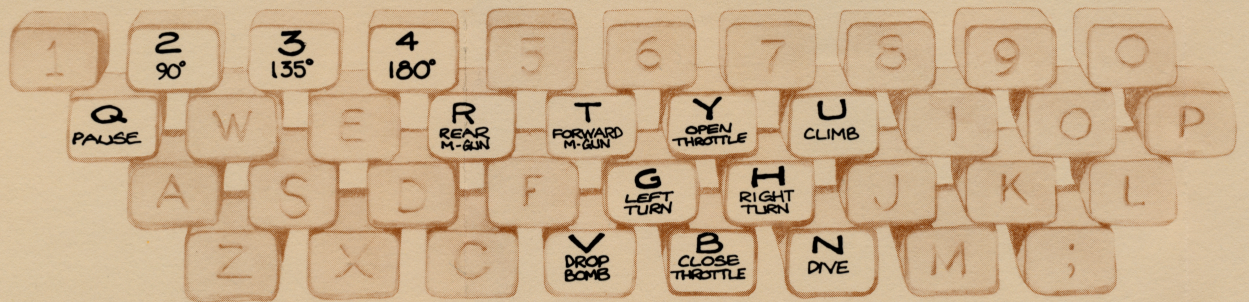

LAFAYETTE ESCADRILLE...legend

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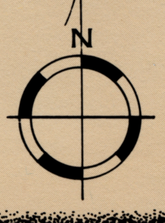

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LAFAYETTE ESCADRILLE

Heavily laden with bombs, your DH4 struggles into the air, narrowly clearing the trees at the end of the runway. The big bomber climbs steadily as you head eastward towards the rising sun. To the south a troop train chuffs hastily back from the front as you level off and turn southeast towards your objective. You hug the bottom of a concealing cloud layer as you cross the zig-zag trenches of the Western Front. So far—so good—the bridge you seek becomes visible in the distance. You throttle back and descend for a bombing run—But wait—look out! A Fokker Triplane has been stalking you! He closes in, guns blazing—You nose up, heading for the clouds—STALL!!

Too bad, you didn't make it, but there's always a next time in **Lafayette Escadrille**. Fly any of two dozen WWI Allied or German bombers or fighters in this **Real-Time Animated Action** computer game.

MANUALS & CASSETTE FOR 16K TRS80 MODEL I & III

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